CHAPTER 2

DESCRIPTION OF THE SEQUATCHIE RIVER WATERSHED

2.1. BACKGROUND. The Sequatchie River drains the Sequatchie Valley, a large valley in the Cumberland Plateau in eastern Tennessee. The Sequatchie River was named after the Cherokee Chief, Sequachee, who signed a treaty with the colonial government of South Carolina. Sequachee means “opossum, he grins or runs,” in Cherokee. The Sequatchie's source is a massive spring which flows out of Devilstep Hollow Cave, a large limestone cavern. It receives the drainage of Grassy Cove, a pastoral limestone region several miles to the north from which the drainage has no surface outlet, but flows through a spectacular series of underground passages.

This Chapter describes the location and characteristics of the Sequatchie River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Sequatchie River Watershed is located in Middle Tennessee and includes parts of Bledsoe, Cumberland, Grundy, Marion, Sequatchie, and Van Buren Counties.

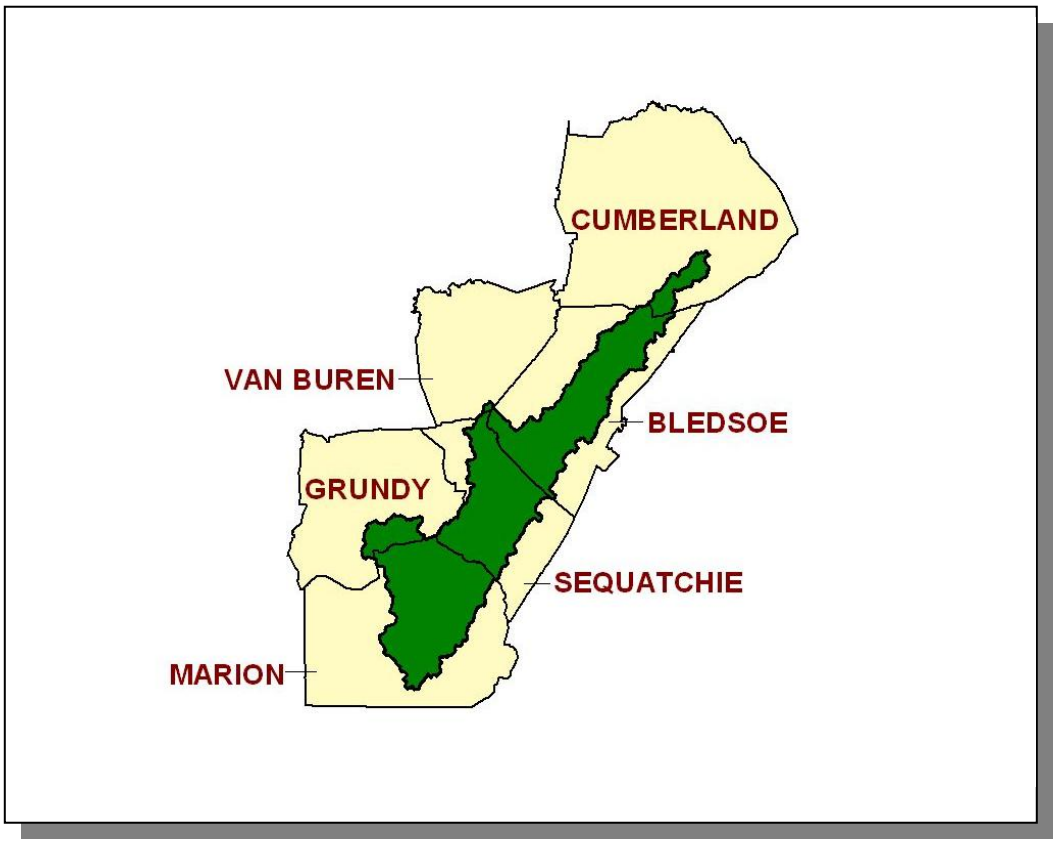

Figure 2-1. General Location of the Sequatchie River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Marion	33.32
Bledsoe	31.38
Sequatchie	25.80
Grundy	4.93
Cumberland	4.35
Van Buren	0.23

Table 2-1. The Sequatchie River Watershed Includes Parts of Six Tennessee Counties.

2.2.B. Population Density Centers. One interstate and thirteen highways serve the major communities in the Sequatchie River Watershed.

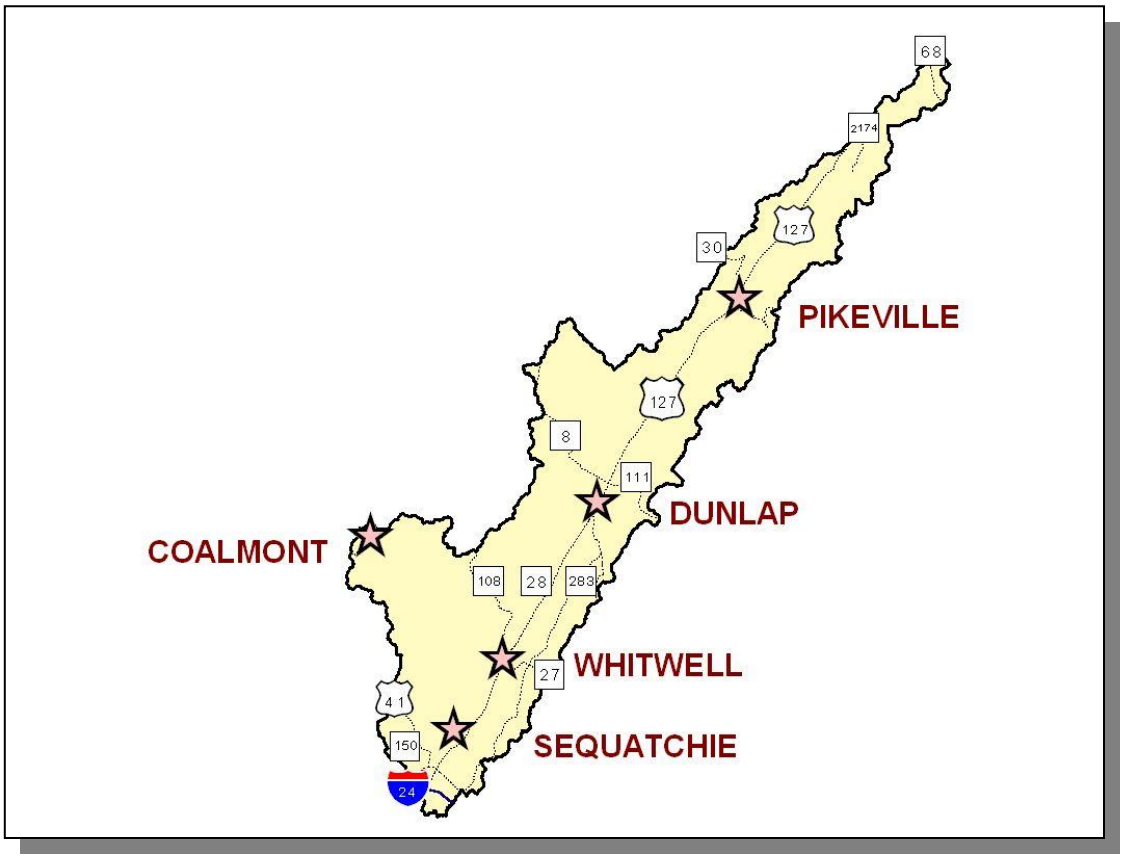

Figure 2-2. Communities and Roads in the Sequatchie River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Dunlap*	4,173	Sequatchie
Sequatchie	1,783	Marion
Pikeville*	1,781	Bledsoe
Whitwell	1,660	Marion
Coalmont	948	Grundy

Table 2-2. Municipalities in the Sequatchie River Watershed. *Population based on 2000 census (Tennessee Blue Book) or http://www.hometownlocator.com. Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Sequatchie River Watershed, designated 06020004 by the USGS, is approximately 601 square miles and drains to the Sequatchie River.

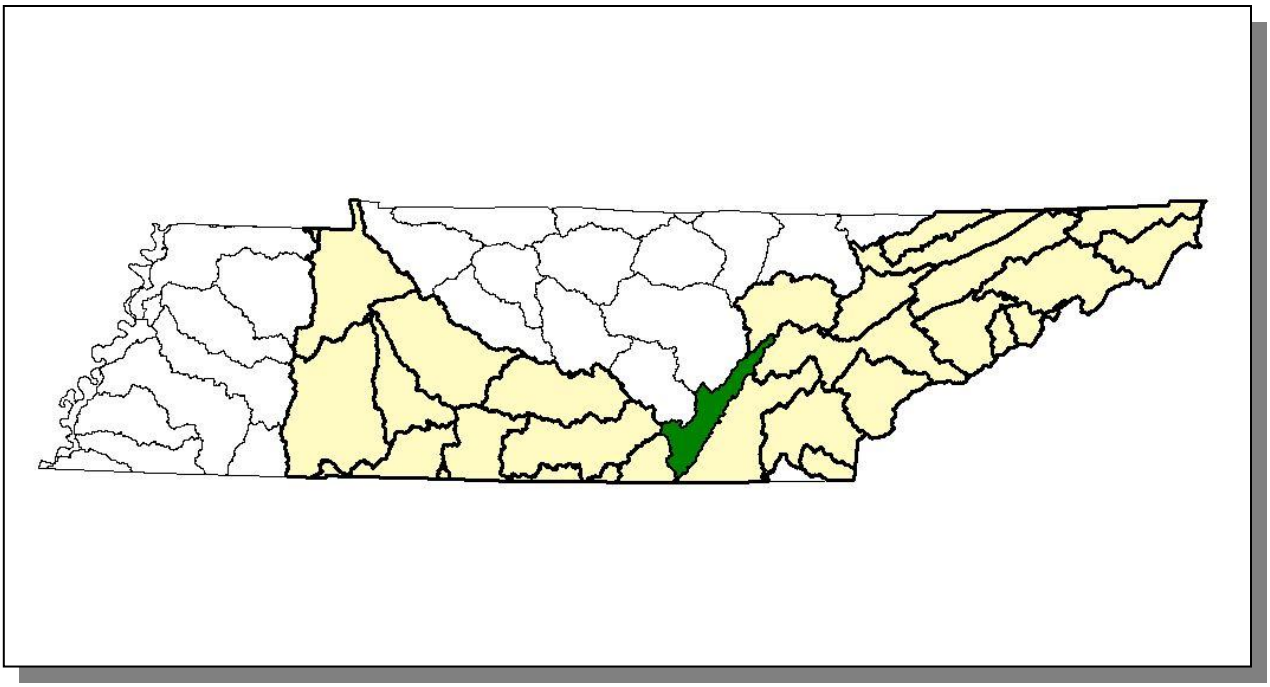

Figure 2-3. The Sequatchie River Watershed is Part of the Tennessee River Basin.

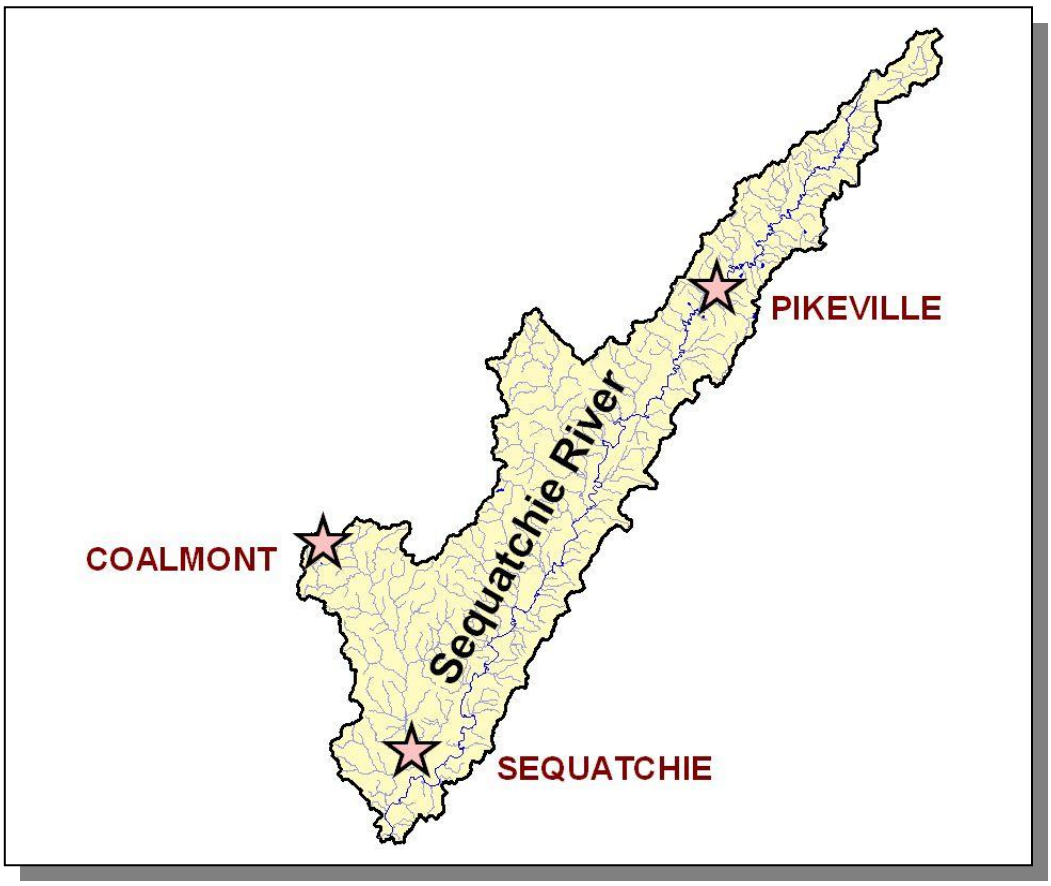

Figure 2-4. Hydrology in the Sequatchie River Watershed. *There are 909.3 stream recorded in River Reach File 3 in the Sequatchie River Watershed. Location of the Sequatchie River and the cities of Coalmont, Pikeville, and Sequatchie are shown for reference.*

2.3.B. Dams. There are 19 dams inventoried by TDEC Division of Water Supply in the Sequatchie River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

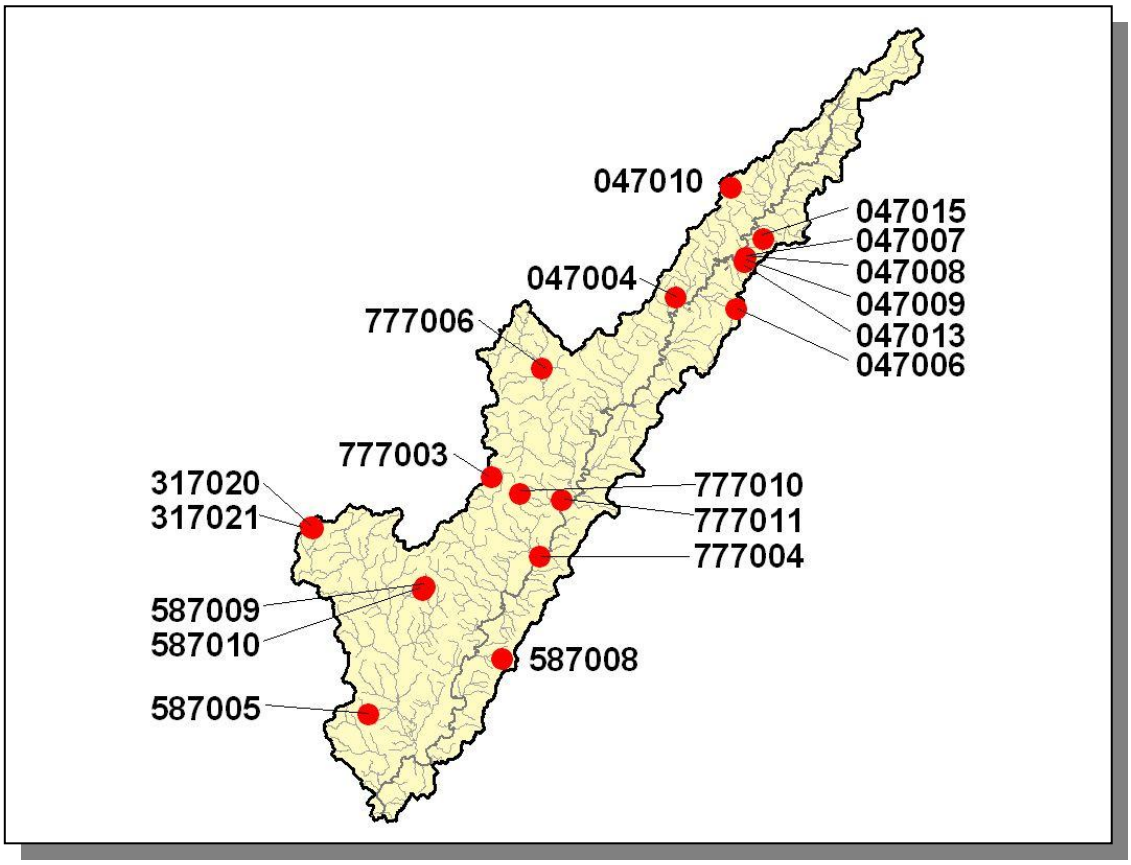

Figure 2-5. Location of Inventoried Dams in the Sequatchie River Watershed. *More information, including identification of inventoried dams labeled, is provided in Appendix II and at http://gwidc.memphis.edu/website/dams/viewer.htm.*

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 2001 Multi-Resolution Land Cover (MRLC) satellite imagery.

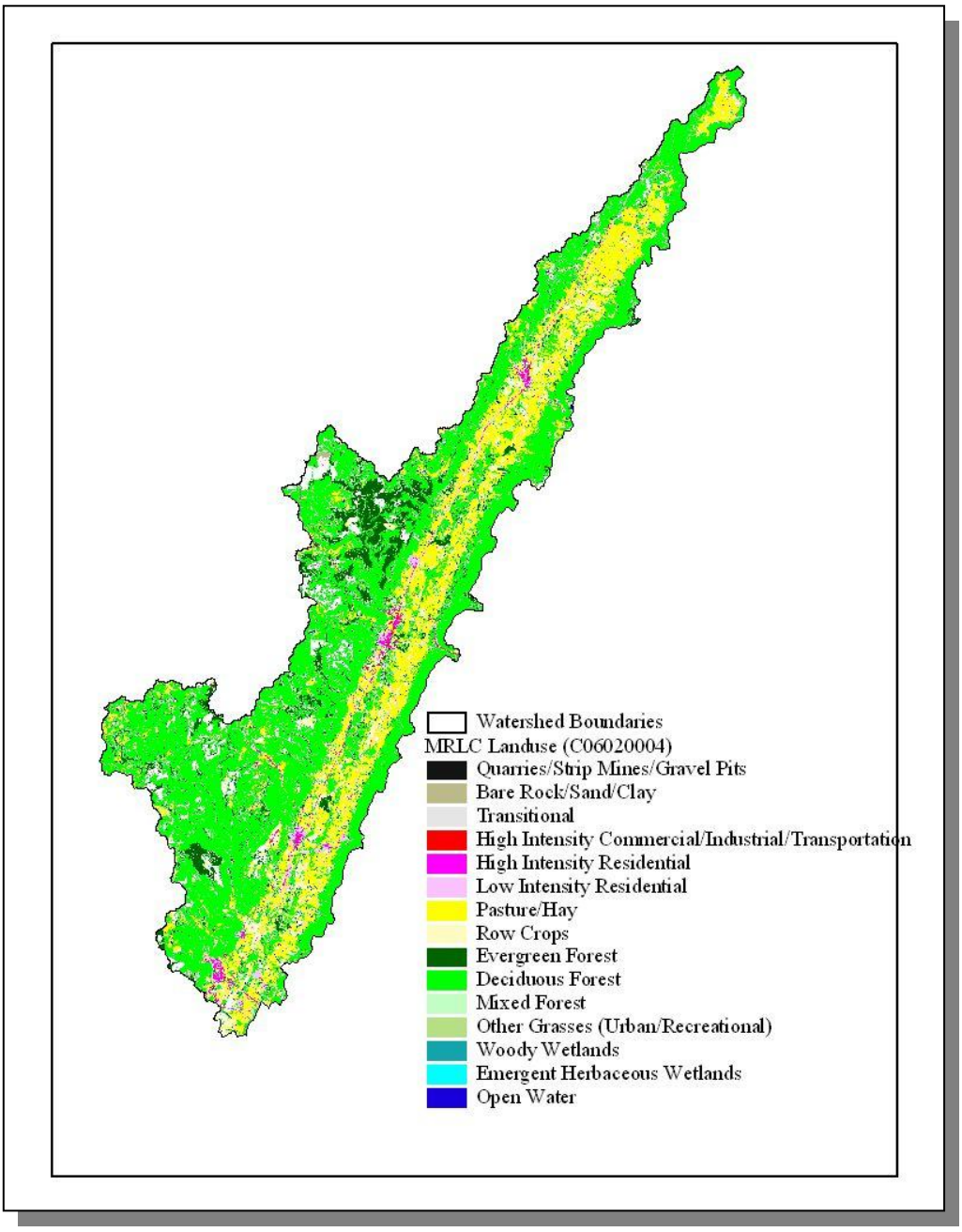

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

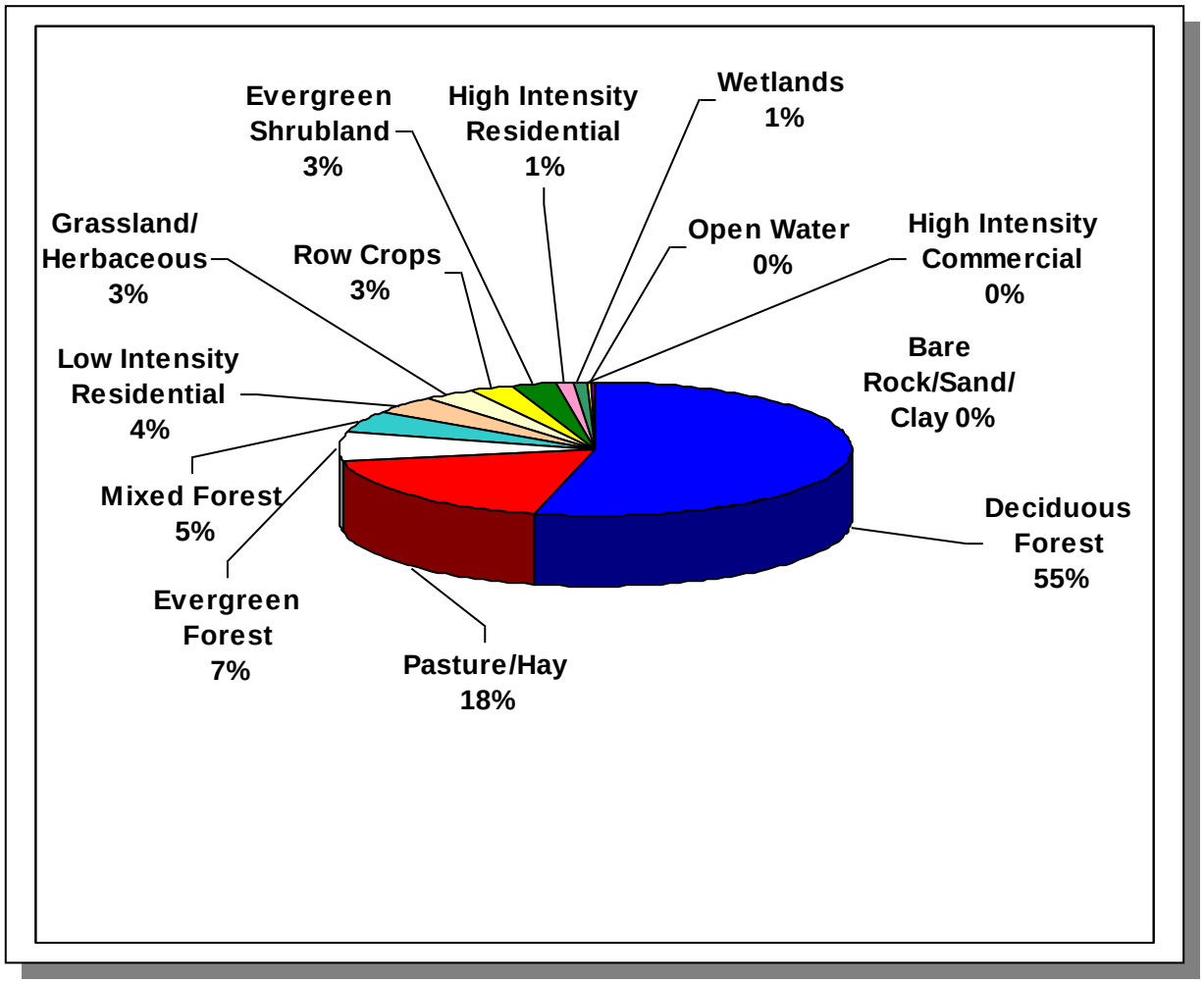

Figure 2-7. Land Use Distribution in the Sequatchie River Watershed. *More information is provided in Appendix II.*

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term “karst” describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term “karst” is named after a famous region in the former country of Yugoslavia.

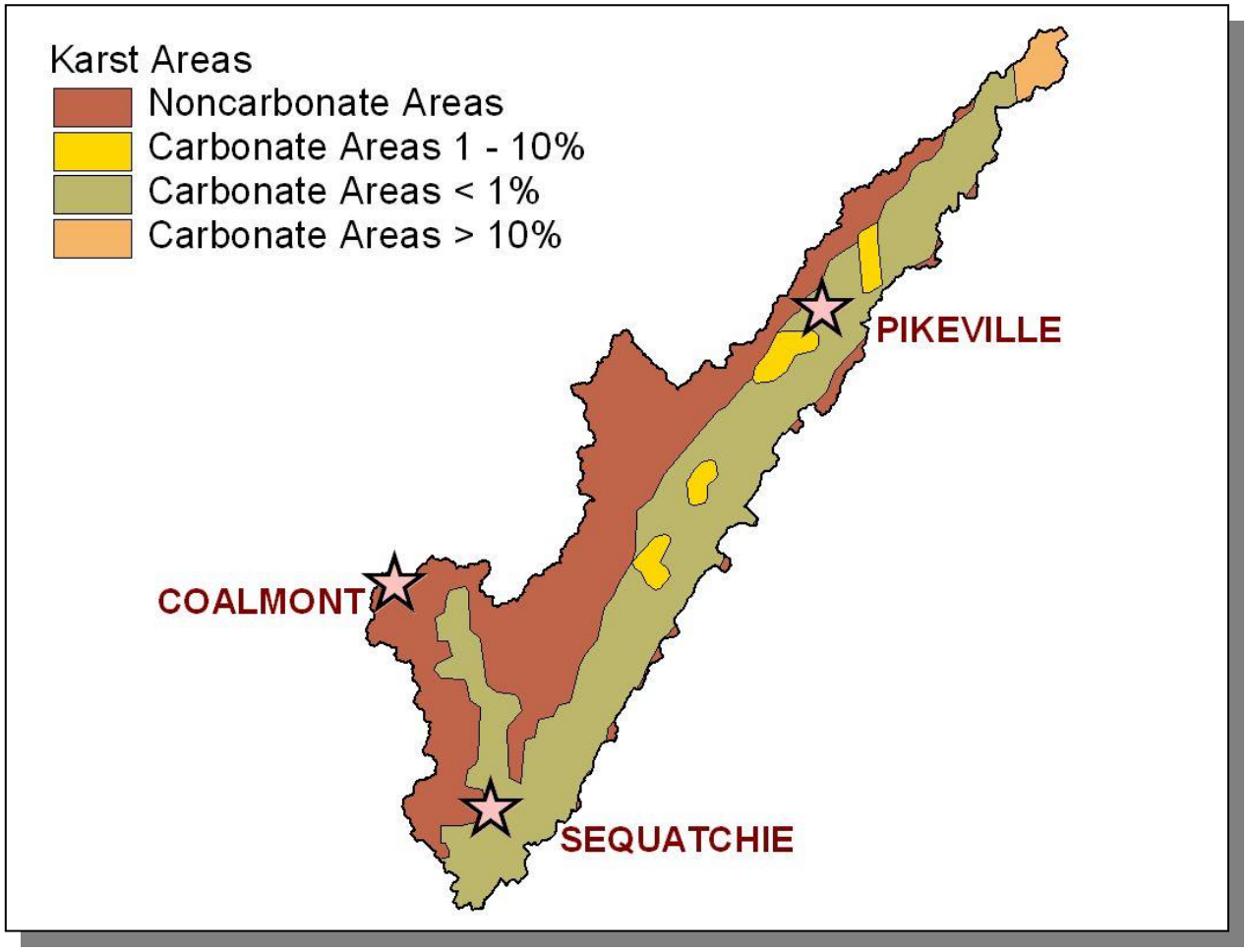

Figure 2-8. Illustration of Karst Areas in Sequatchie River Watershed. *Locations of communities in the watershed are shown for reference.*

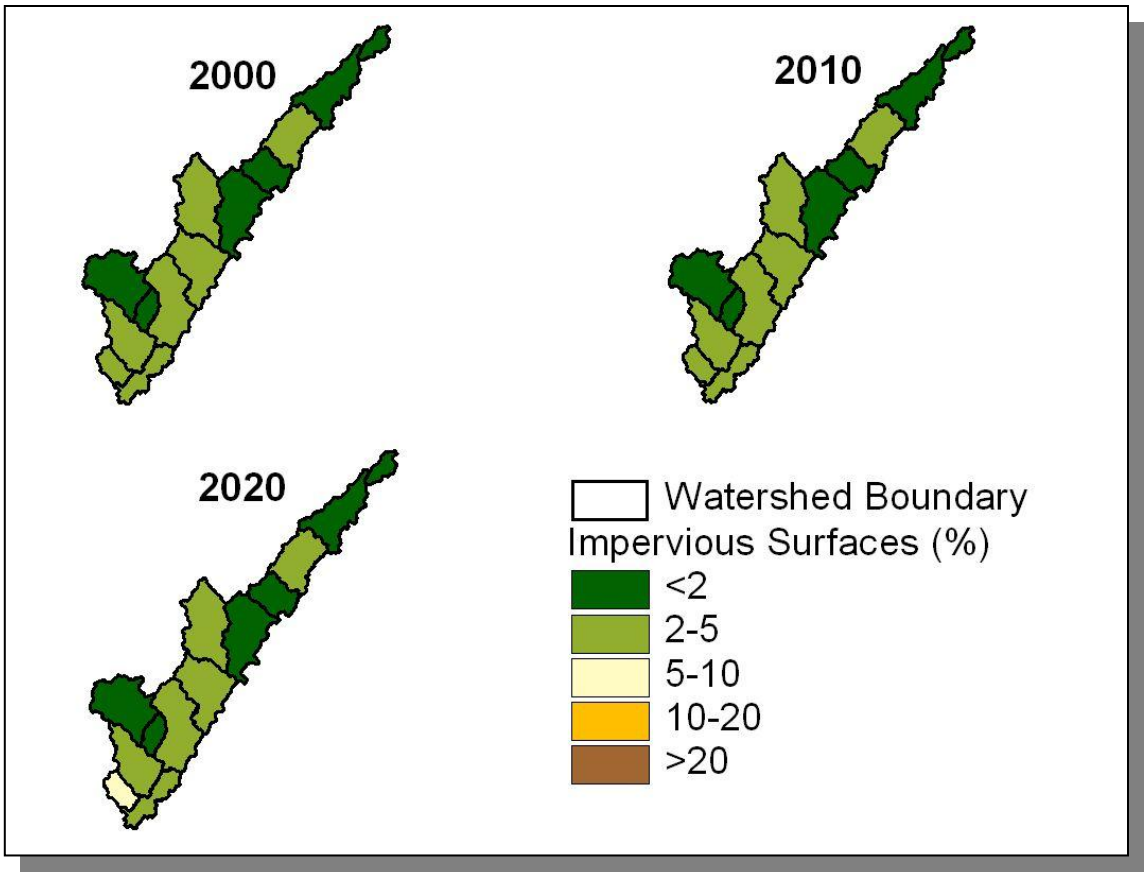

Figure 2-9. Illustration of Total Impervious Area in the Sequatchie River Watershed. *All HUC-12 subwatersheds are shown. Current estimates and projected total impervious cover calculated by HUC-12 are provided by EPA Region 4. More information can be found at:* *http://www.epa.gov/ATHENS/research/impervious/*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Sequatchie River Watershed lies within 1 Level III ecoregion (Southwestern Appalachians) and contains 3 Level IV subecoregions:

- The **Cumberland Plateau's (68a)** tablelands and open low mountains are about 1000 feet higher than to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. The plateau surface is less dissected with lower relief compared to the Cumberland Mountains or the Plateau Escarpment (68c). Elevations are generally 1200-2000 feet, with the Crab Orchard Mountains reaching over 3000 feet. Pennsylvania-age conglomerate, sandstone, siltstone, and shale is covered by mostly well-drained, acidic soils of low fertility. The region is forested, with some agriculture and coal mining activities.

- The **Sequatchie Valley (68b)** is structurally associated with an anticline, where erosion of broken rock to the south of the Crab Orchard Mountains scooped out the linear valley. The open, rolling valley floor, 600-1000 feet in elevation, is generally 1000 feet below the top of the Cumberland Plateau. A low, central chert ridge separates the west and east valleys of Mississippian to Ordovician-age limestones, dolomites, and shales. Similar to parts of the Ridge and Valley (^&), this is an agriculturally productive region, with areas of pasture, hay, soybeans, small grain, corn, and tobacco.

- The **Plateau Escarpment (68c)** is characterized by steep, forested slopes and high velocity, high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvania-age shale, siltstone, sandstone, and conglomerate. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-tulip poplar, sugar maple-basswood-ash-buckeye), with hemlock along rocky streamsides and river birch along floodplain terraces.

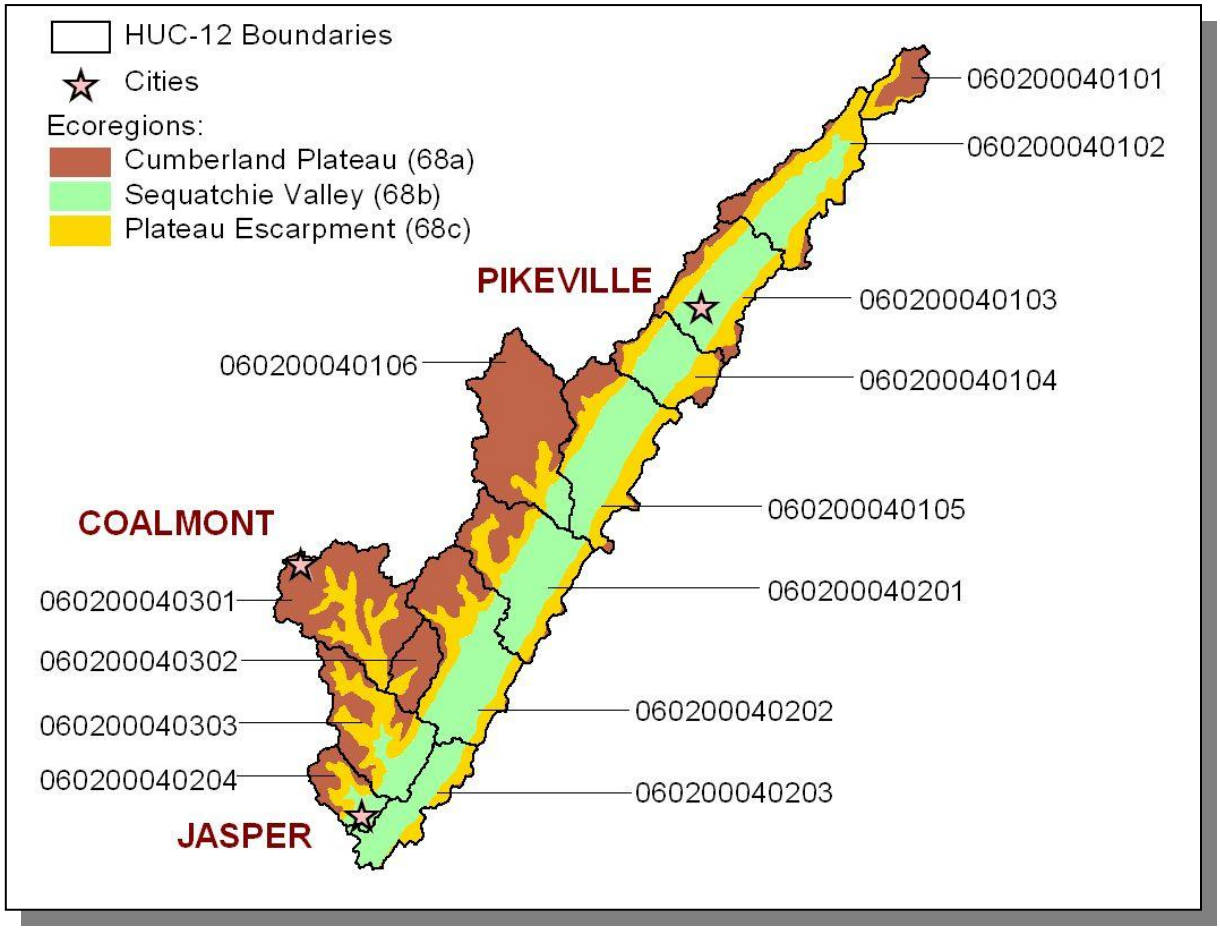

Figure 2-10. Level IV Ecoregions in the Sequatchie River Watershed. *HUC-12 subwatershed boundaries and locations of Coalmont, Jasper, and Pikeville are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition within that ecoregion and may not be representative of a pristine condition.

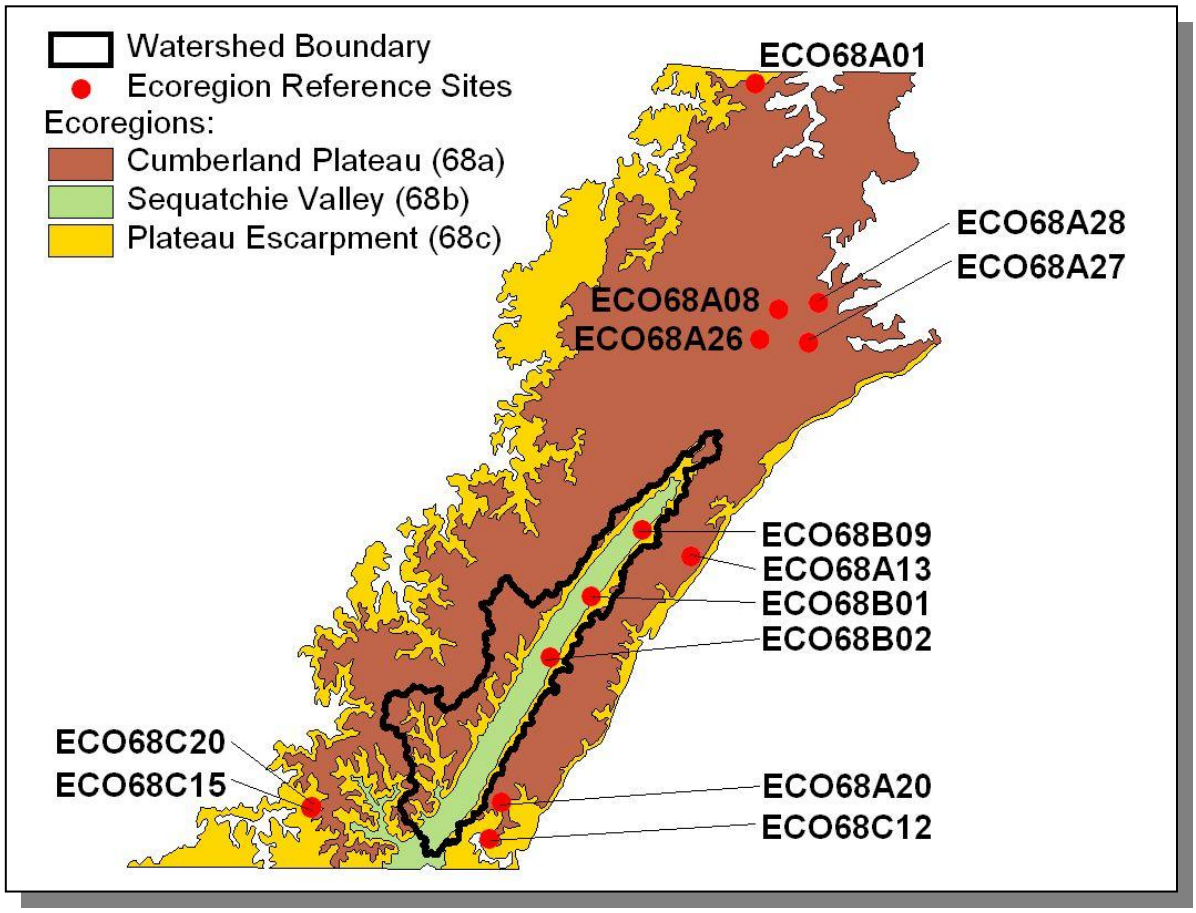

Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 68a, 68b, and 68c. *The Sequatchie River Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 06/01/2006, is provided in Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Areas administers the State Natural Areas program. Further information may be found at http://www.state.tn.us/environment/na/.

The Sequatchie River Watershed has two Designated State Natural Areas:

The Chimneys is a 33-acre natural area located in Marion County. It is located in what is commonly referred to as the Pocket Wilderness where Pocket Creek cuts through Cumberland Plateau sandstone forming Pocket Gorge. Pocket Creek has sculpted the impressive feature known as the Chimneys over vast geological time. They are two isolated, 200-feet high, towering pinnacles of Pennsylvanian Warren Point sandstone connected to a central base. A natural window forms at the base. The pinnacles and natural bridge rise from the gorge floor and are nearly as high as the surrounding bluff. The natural area is adjacent to the Chimneys Scenic Park. It was designated as a state natural area in 1999, the same year it was donated to the state by U.S. Steel Corporation, a subsidiary of Marathon Ashland Petroleum, LLC.

Sequatchie Cave is an eight-acre natural area located in Marion County. It is biologically significant area located where Owen Spring Branch flows from the mouth of the cave at Sequatchie Cave Park in Marion County. The cave and its cold spring water support three federally and state listed species, three species of state concern, and many other aquatic and cave species. This is one of two sites where the federally endangered Royal Snail (Pyrgulopsis ogmorphaphe) is known in the world. Both are in Marion County. This is also the site where the rare cadisfly (Glyphopsyche sequatchie) was first described, making it the type locality for this species from which the official description derives.

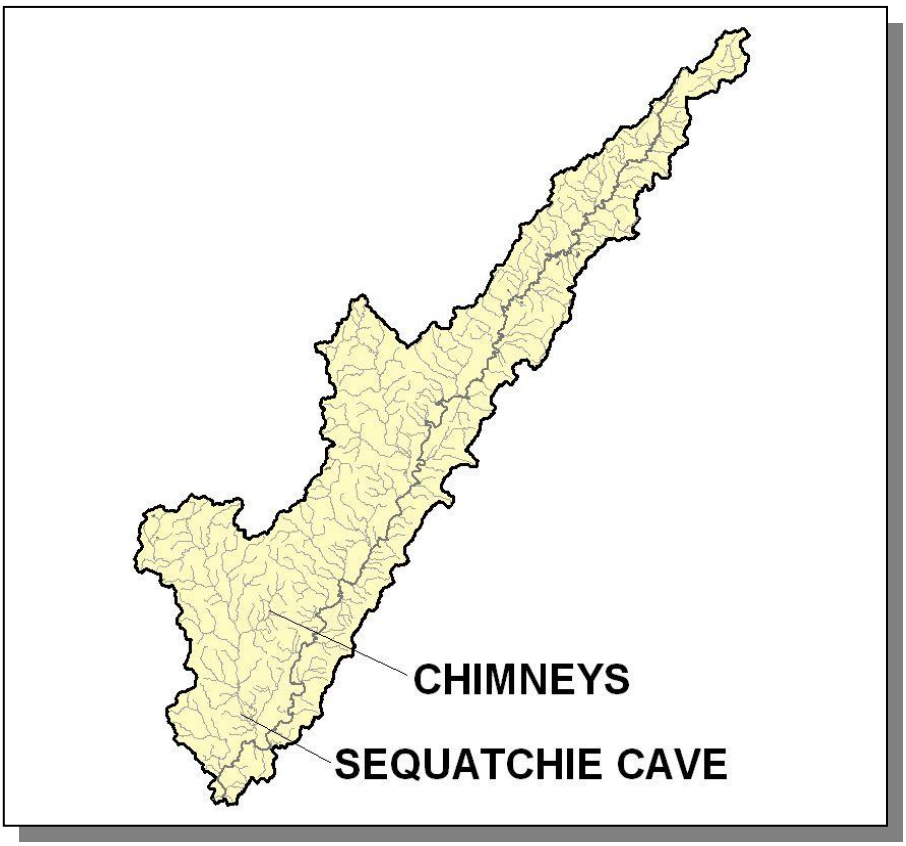

Figure 2-12. There are Two Designated State Natural Areas in the Sequatchie River Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Areas maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	2
Insects	8
Mussels	2
Snails	4
Other	2
Amphibians	2
Fish	5
Mammals	3
Plants	18
Total	**46**

Table 2-3. There are 46 Known Rare Plant and Animal Species in the Sequatchie River Watershed.

In the Sequatchie River Watershed, there are five known rare fish species, two known rare amphibian species, two known rare crustacean species, two known rare mussel species, and four known rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Carpiodes velifer	Highfin Carpsucker		D
Etheostoma denoncourti	Golden Darter		
Hemitremia flammea	Flame Chub		D
Percina tanasi	Snail Darter	LT	T
Phoxinus tennesseensis	Tennessee Dace		D
Cryptobranchus alleganiensis	Hellbender	No Status	D
Hemidactylium scutatum	Four-toed Salamander		D
Cambarus pristinus	A Crayfish		E
Cambarus hamulatus	Cave Crayfish		
Toxolasma cylindrellus	Pale Lilliput	LE	E
Cumberlandia monodonta	Spectaclecase	C	
Marstonia ogmorhaphe	Royal Snail (Royal Marstonia)	LE	E
Helicodiscus hexodon	Toothy Coil		
Athearnia anthonyi	Anthony's River Snail	LE, XN	E
Vertigo pygmaea	Crested Vertigo		

Table 2-4. Rare Aquatic Species in the Sequatchie River Watershed. *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service; C, Candidate for federal listing, information indicates that listing is justified by the U.S. Fish and Wildlife Service; XN, Non-essential experimental population by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at http://www.state.tn.us/environment/na/.*

2.6.C. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/na/wetlands/

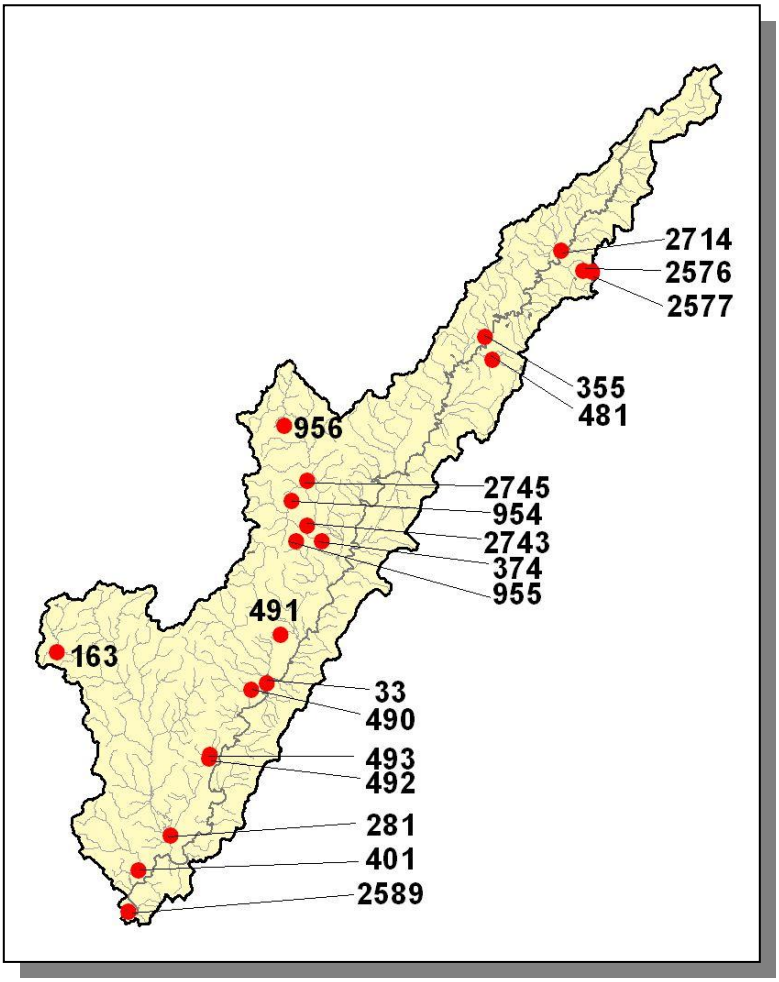

Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Areas Database in Sequatchie River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. *There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of five streams in the Sequatchie River Watershed:

Bee Creek (RM 0 to RM 24) is a small twisting, plunging stream with small to medium drops, boulders, ledges, and bluffs. It flows through a densely forested corridor, including Bledsoe State Forest, that provides for wildlife habitat.

Cane Creek of Caney Fork (RM 0 to RM 31) flows through Fall Creek Falls State Forest and Park. It is narrowly incised with rugged, rocky landscape, dense laurel thickets and good whitewater.

Little Sequatchie River (RM 0 to RM25) is a scenic stream that supports game fishery.

Rocky River (RM 10 to RM 28) is a scenic stream with Karst topography.

Sequatchie River (RM 0 to RM 109) is a clean, pastoral float stream that flows through a beautiful narrow scenic valley.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE
Bee Creek	X	X	X	X	X
Cane Creek	X	X	X	X	X
Little Sequatchie River	X	X		X	X
Rocky River	X	X	X	X	X
Sequatchie River	X	X	X	X	X

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/

2.7.B. Public Lands. Some sites representative of the cultural heritage are under state or federal protection:

- Grassy Cove Karst Area is a 10,470-acre National Natural Landmark and managed by the National Park Service. More information may be found at: http://www.nature.nps.gov/nnl/Registry/USA_Map/States/Tennessee/NNL/GC/index.cfm

- Harp Wetland WMA is managed by TWRA in Bledsoe County.

- Prentice Cooper State forest covers 24,311-acres of forestland and is managed by the Tennessee Department of Agriculture (TDA). More information may be found at: http://www.state.tn.us/agriculture/forestry/stateforests/7.html

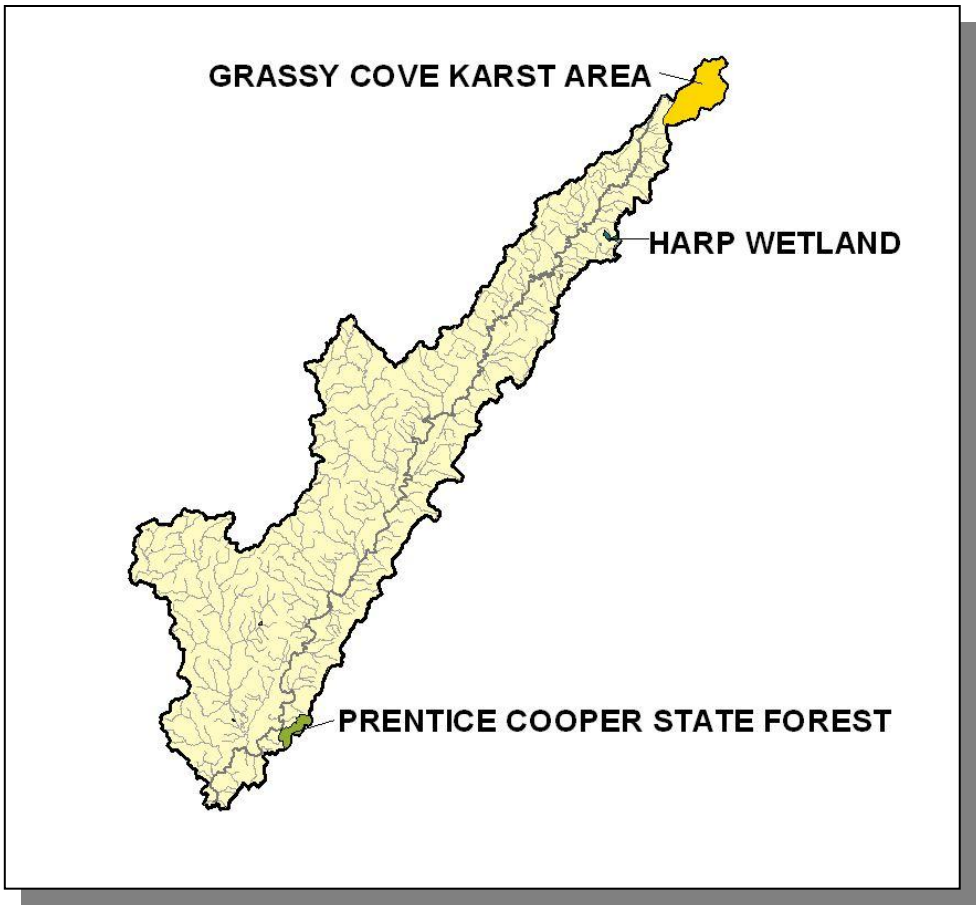

Figure 2-14. Public Lands in the Sequatchie River Watershed. *Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.*

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/publications/riv/

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Big Brush Creek	1,2	2,3		Little Brush Creek	3		
Cannon Creek				Little Sequatchie Rive	2	2	3,4
Clifty Creek	3			Mason Creek			
Crystal Creek	4			North Fork Pryor Cave Creek	2		
Dixon Creek	2			Peters Cave Creek	4		
Grays Creek	3			Pocket Creek	1		1
Griffith Creek	3			Scott Creek	2		3
Hicks Creek	2	3		Sequatchie River	2,3	1,2	1
Indian Creek				Skillern Creek	4		
Johnson Mill Creek	3			Stone Creek	2		
Laurel Creek	4			Woodcock Creek	2		

Table 2-6. Tennessee Rivers Assessment Project Stream Scoring in the Sequatchie River Watershed.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed